Fundamental of Programming with C#

Day 5 Quiz

You are asked to implement income tax calculator for Singapore. The tax rate table is given in Figure 1.

No	Chargeable Income	Income Tax Rate (%)	Gross Tax Payable ($)
0	First $20,000	0	0
	Next $10,000	2	200
1	First $30,000	-	200
	Next $10,000	3.5	350
2	First $40,000	-	550
	Next $40,000	7	2,800
3	First $80,000	-	3,350
	Next $40,000	11.5	4,600
4	First $120,000	-	7,950
	Next $ 40,000	15	6,000
5	First $160,000	-	13,950
	Next $ 40,000	17	6,800
6	First $200,000	-	20,750
	Next $120,000	18	21,600
7	First $320,000	-	42,350
	Above $320,000	20	

Figure 1. Singapore Resident Tax Rate (source: IRAS)

As an illustration, someone with $100,000 annual income will fall under the bracket no 3 and have to pay $3,350 for the first $80,000 of the taxable income and will be taxed at 11.5% for the remainder of the taxable income. The calculation would be 11.5% * ($100,000 – $80,000) + $3,350 = $2,300 + $3,350 = $5,650.

You are asked to write the program in modular fashion by implementing the method as prescribed in the specification below.

Specification of the methods

Method Name	***Description***
`Main` (code given)	The main method should: - Get the taxable income from the user - Get the tax bracket of the user - Calculate the taxable income based on the tax bracket - Print the result
`AskForIncome`	This method takes no argument and return an **integer** that contains the taxable annual income of the user. This method should: - Prompt the user for annual taxable income. "Please enter your annual taxable income: " - Return the entered income as an integer
`GetTaxBracket`	This method takes one argument: the annual income of the user and returns an integer that indicates the tax bracket index that the user belong to. The logic for this method should be: - Look for the **largest** index in the minIncome array where the minIncome is **smaller** than the annual income given - Return the largest index found - If the income is less than 20,000, no index would be found, return -1.

`CalculateIncomeTax`	This method takes two arguments:
	- The annual income
	- The tax bracket index
	And return the payable tax (use double data type for the payable tax)
	
	The logic for this method should be:
	- If the tax bracket index is -1, then no tax is payable.
	- Take the following values from the different arrays:
	  o Minimum income (from minIncomeArray)
	  o Tax rate (from taxRateArray)
	  o Base Payable Amount (from basePayableAmountArray)
	- Calculate the payable tax by using the formula:
	
	Payable tax = (annual income – minimum income) * tax Rate + base payable amount
	- Return the payable tax amount

`PrintResult`	The arguments for this method are: - The taxable annual income - The payable tax amount The console output of this method should match the sample output given. The income and tax amount should be formatted in currency format.

The Main method for the program is given as displayed below:

```
using System;

namespace TaxCalculator
{
    class Program
    {
        //these arrays is visible in all the static method,
        //so you can use them in your method implementation

        static int[] minIncomeArray = new int[]
            { 20000, 30000, 40000, 80000,
              120000, 160000, 200000, 320000 };
        static double[] taxRateArray = new double[]
            { 0.02, 0.035, 0.07, 0.115,
              0.15, 0.17, 0.18, 0.20 };
        static int[] basePayableAmountArray = new int[]
            { 0, 200, 550, 3350,
              7950, 13950, 20750, 42350 };

        static void Main(string[] args)
        {
            int annualIncome = AskForIncome();
            int taxBracket = GetTaxBracket(annualIncome);
            double taxPayable =
                CalculateIncomeTax(annualIncome, taxBracket);
            PrintResult(annualIncome, taxPayable);
        }

        //YOUR CODE HERE
}
```

Sample outputs from multiple executions:

```
Please enter your annual taxable income: 100000
For taxable annual income of $100,000.00, the tax payable amount is
$5,650.00


Please enter your annual taxable income: 0
For taxable annual income of $0.00, the tax payable amount is $0.00

Please enter your annual taxable income: 1000000
For taxable annual income of $1,000,000.00, the tax payable amount is
$178,350.00
```